

air-hole the slice is withdrawn and the stream passes on to make the next bell. Long may they hang to summon in a distant land our fellow-men to holy teaching.

About twenty-four hours suffice to cool an ordinary bell sufficiently to allow of the removal of the earth around it: the mould is then broken off with small hatchets, and the bell is removed to the shops to be tuned by means of the "turning machine." When a set of bells turn out to be in harmony, without tuning, they are called a "maiden peal," but this does not often happen.

Something might usefully be said of the mode of hanging bells, the "cage," as it is called, and the wheels, but this we must defer. Reference has been made in our pages to the present disgraceful state of many belfries, and it is high time that the churchwardens looked to them, and set them in order. In some that we have seen lately, pigeons and other birds have provided all the materials for producing spontaneous combustion. The Rev. Henry Ellacombe, who, like a refined Quasimodo, hangs about his bells with affection, has urged the necessity of reform in the conduct of the ringers, too, and has drawn up a set of rules with that end in view.\* The Reverend writer points out a method by which,—

"To call the folk to church in time,  
One little boy six bells can chime."

This may be effected either by heavy hammers to strike outside on the "bridge" of the bells, like those of a clock; or, by fixing light hammers or balls, proportioned in size, and in length of lever, to each bell, and so arranged to work on an axis as to strike on the inside—just where the clapper strikes,—and when not in use, to drop down, so as to be quite clear of the swing of the bell when rung. A cord, or "sash line," fastened at the end of the lever, may be guided by pulleys to a given point in the church, where the ends are tied, when used, to a fixed horizontal bar.

A set of brick able ringers at work is an interesting scene, and if you tumble up still higher, you will see a sight you will not soon forget: the bells, dancing and whirling, and banging and clashing, produce a stunning and bewildering effect on the strongest nerves: we tried it once and intend never to do so again. Charles Lamb calls bells "the music nearest bordering on heaven;" but it is not every one who lives near a church who thinks so; and ringers will do well, therefore, to use their privileges with judgment, or they may hear something closely resembling a French verse, which Mr. Gatty translates into,—

"Disturbers of the human race,  
Your bells are always ringing;  
I wish the ropes were round your necks,  
And you upon them swinging."

And for fear you, the aforesaid gentle reader, should think that our clapper has run long enough, we, too, will finish our "touch," and tie up the ropes for to-day.

**A NEW PATENT MATERIAL.**—The Earl of Dundonald has obtained a patent for "improvements" in sewers, drains, &c., and for making columns and vases. The substance patented is *bitumen* of various kinds, according to circumstances. The pipes are to be cast with one side flat. The patentee proposes to use it for concrete, also for foundations under water.

\* Practical Remarks on Belfries and Ringers. George Bell, London. 1830.

## ROYAL ACADEMY LECTURES ON ARCHITECTURE.

In his second Lecture, on the 15th instant, Professor Cockerell proceeded to illustrate the principles laid down in the preceding lecture. He observed that most works on the history of architecture began by tracing to their origin, in the tent, the hut, and the wigwam, the temples of Greece and Rome, and all the other masterpieces of architecture. On this point he would only say, that the building art was coeval with man's first appearance upon the earth: his habitation was, indeed, inseparable from his existence, and as essential as the hive to the bee, or the hut to the beaver. Milton had described the bower constructed by our first parents in Paradise; whilst the city built by Cain, with Noah's ark, and the Tower of Babel, furnished proofs of the antiquity of that art which was, indeed, a portion of the natural history of man.

Next to the roof and walls, the first elements of architectural construction were the pillar and the impost, which, by natural steps, became, in after times, the shaft, the capital, and the entablature. These types assumed the form of the mere post and beam in woody countries; but where that material was scarce, sundried or kiln-burnt bricks were employed.

The observation of the forms of nature led to the improvement of the column, to its gradual and graceful diminution, and to the use of *entasis*. The same study of nature, aided by the curves derived from the conic sections, enabled the Greeks to invent their admirable mouldings; the ovola, the ogee, and the cymatium. The Romans, on the contrary, were satisfied, as engineers, with those curves and profiles which could be produced by the compass, and neglected the conic sections. The latter were the true source of the beautiful, and furnished the elements of that quality alike in the details of Greek, Gothic, Saracenic, and Chinese architecture.

The elements of architecture were of the simplest kind; the column, with its entablature, forming the classic order; and the architect who possessed the three orders—Doric, Ionic, and Corinthian—with the arch, was, in fact, fully furnished with his stock in trade. These materials might be compared with the letters of the alphabet; and only mind was wanting to enable the architect to achieve with the former like wonders as those which Homer and Shakespeare had accomplished with the latter. The architect had no right to lament the paucity of his materials: all that was needed was poetic thought and happy invention.

The lecturer proceeded to consider the elements of lines, to which the architect is required to give language and expression. By the horizontal and perpendicular lines mankind were furnished with standards whereby to reconcile the greatest confusion; and they afforded types by which the sublime in architecture had been sought,—in a hilly country by the former, and in a flat country by the latter. The first sight of the sea, after travelling over an undulating country, illustrated the agreeable effect of the horizontal line. Under these circumstances, the landsmen confessed the majesty of Neptune, and admitted his sublimity; and the enthusiasm displayed by the Ten Thousand, in their famous retreat under Xenophon, at the first sight of the sea, might be ascribed not merely to the prospect of a speedy return to their beloved homes, but in part to the natural effect of the sublime horizontal line of the ocean. In hilly and romantic Greece, the long level line of its temples, with their regularly ordered colonnades, furnished repose to the eye, and admirably contrasted with the flowing lines of the accompanying landscape. And where the straight lines of Greek architecture were broken, as they were in some of the works of the Adamans, the effect was consequently bad. In flat countries the perpendicular line was naturally adopted in architectural compositions on the same principle.

The beauty of the straight line was keenly appreciated by the Greeks; and it was still to be traced by the adoption in our own language of the words *orthodox*, *orthography*, &c., showing that the straight, the level, and the upright

were the correct in morals as well as in art. Contrast was an important source of the beautiful, and the rules referred to would supply a useful guide to the architect in adapting his design to its site.

The diagonal line was a natural source of delight in its various angles with the horizontal and the perpendicular. Right angles were always avoided by engravers, who produced their sweetest effects by the more obliquely angular lines. The general and continuous admiration of the pyramid and the pediment sufficiently proved the attraction of diagonal lines, and it might be seen also by their prevalence in the sculpture accompanying Greek architecture, the effect of which was much enhanced by its contrast with the straight lines of the architecture. So carefully indeed did the Greeks avoid placing in conjunction with their architecture any perpendicular or horizontal line in the sculpture, that they appear to have had an utter abhorrence of the parallelism which must ensue. This feeling was especially manifested in Phigalian sculptures, as well as in those of Halicarnassus and the Budrum Mausoleum.

In proceeding to consider architectural forms in plan and elevation, it might be observed that a square was a better form of plan for a tower, than a parallelogram. A square house, on the contrary, was stigmatised as a box; and dwellings with more propriety assumed, like the Greek temples, the form of a parallelogram. A tower which took the form of a parallelogram in plan was altogether a solecism, as might be illustrated by reference to the tower of the New Church in the Strand, by Gibbs. The disagreeable effect, and indeed the deformity, of the tower of that church, so far as its plan was concerned, was only to be seen as approaching it from Drury-lane. If it had been so placed as to have been viewed at an angle, it must have created a public scandal, and long since have been altered; but its peculiar position was, no doubt, duly considered by the architect, who accordingly spread out the tower so as to increase the effect, as viewed from the Strand, and felt it unnecessary to give it a corresponding depth.

The plan of the Roman temples was a double cube: those of the Greeks were rather more. That ordinarily adopted for the plan of modern churches, namely, a parallelogram of 2 by 3, or 60 feet by 90, had a very unpleasant effect internally,—as might be seen in St. James's Church, Piccadilly,—showing the necessity of a clerestory to restore its tasteful proportion. The proportion of 3 by 2, or 36 feet by 24, was an admired proportion for internal apartments in the best houses of this country; but 5 by 3, or 40 feet by 24, was, in his opinion, much more effective. The latter was recommended by Palladio, whose rules on this subject, as well as those of Vitruvius and Alberti, might be studied with advantage.

The triangular form might be characterized as the root of Gothic architecture, not only from its frequent employment emblematically, as the symbol of the Trinity, but from its geometrical combinations. Regarding the square form in its application to Greek architecture, and the triangular to Gothic, they might be likened to the four-legged and the three-legged stool; and, apart from any partiality or prejudice for or against either style of architecture, it must be acknowledged that the Gothic—the acute or triangular—must be ever meagre and unsatisfactory in its effect, compared with the Greek, of which the square form might be regarded as the basis. In triangular forms there must be absolute light contrasted with absolute darkness; whereas, in square or circular compositions, an exquisite gradation of middle tints was obtained. In the circular form this was especially manifested. The Colosseum and the Pantheon, the Crescent at Bath, the Castle of St. Angelo, the column in all its varieties, the rainbow-arch of the bridge, and the vaulted ceiling, were alike wonders of structure, of strength, suavity of form, gradation of light and shade, and beauty of effect from every point of view.

The apparent diminution of circular forms to the eye, unless seen from a distance, made their requisite proportions a matter of serious consideration; and in buildings of circular